The Logger's Bark
RADIO CLUB of TACOMA

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FROM THE EDITOR!

Hello again, fellow club members!

By now, we have hopefully survived the surprise February snow-apocalypse in good fashion! (For future historians, this month bought a big snow storm to Tacoma). Fortunately, it all melted in a couple of days and life went back to normal!

In the meantime, we continue to be in a waiting state. The pandemic continues, much to our displeasure. No club members have gotten it thank goodness! We're all just hanging on waiting to get our vaccines.

In radio news, there has been activity on the air since we are in the midst of contest and DX season. Conditions continue to be fairly rotten, but it is supposed to be improving soon. Right? Right!

This month's issue is a bit smaller than previous ones, but what the heck, February is a smaller month too!

A big thanks goes out to our star contributor this month: Rich KR7W. He checks in with a couple of very good articles a few pages down in this issue.

Also, we hear the meeting reports and the newest list of property up for sale from out property management team.

So sit back, relax, get a cup of coffee an enjoy this issue of the Loggers Bark.

73 Gary WG7X

Editor, Loggers Bark

Page 1: Editors report.

Page 2: BOD Meeting minutes.

Page 6: General meeting minutes.

Page 9: PMT sales list.

Page 12: Repeater notes from KR7W

Page 14: More Show & Tell from KR7W

Page 18: Mailbag!

Radio Club of Tacoma

Board of Directors Meeting Agenda

February 3, 2021

ZOOM Meeting

Meeting called to order at 1900 Local by Mike-W7XTZ

Officers and Directors Present

President Mike Mikuchonis W7XTZ

Vice President Adam Barbera W2NCC

Secretary Mike Drorbaugh W7MKE

Treasurer Steve Dightman AF7YD

Board Bruce Hanson WE7P

Board Paul Matney W7PFU

Board Verna Lilly KF7SCB

Board Red Cranefield WB7EC

Board Phil Pia K7PIA

Quorum?

A quorum was present and 13 people attended all or some of the meeting.

Silent Key or Illness?

Nick Winter –K7MO is still battling his foot issues due to diabetes.

Approval of Minutes

Mike-W7XTZ called for any additions or corrections to January 6, 2021 RCT BOD minutes as circulated and without objections ordered the minutes approved.

Secretary's Report (Mike W7MKE)

Normal stuff handled: membership renewals, magazines, bills, etc. All insurance policies now updated for the year and I'll have the new policies added to the NAS shortly.

Treasurer's Report (Steve AF7YD)

Financial report attached. No one had questions on the report.

Last month Steve ran across a reference book for QuickBooks for non-profit (organizations). It had some good information but lacked some "how to" information. Steve thinks it might be prudent to identify some of the additional structures such as endowments, grants, etc. that may come into play. Currently we use the 990EZ postcard reporting to IRS which we can do if less than $50K gross receipts however if income exceeds that a new IRS form may be need-

ed and our QuickBooks may not be currently structured to accommodate.

Committee / Reports

Membership (Juan KJ7GGB)

George – K7GRS reported as of December 31, 2020 membership was 287 but as of today 234 have renewed and 53 have not yet renewed. History books: 110 have been ordered so far. Salmon run total is $7179 with one pledge of $100 outstanding.

Library (Doug AD7AV)

George – K7GRS indicated a few new books have been added to the library and a new audit will be taken soon. Dr. Oakman-AD7VL has a new book that he's authored available on Amazon.

Training (Stephen AD7AB)

No report VE Report (John AC7WW submitted the following in writing)

On a rainy Tuesday, January 12, 2021 your VE team was host to eight candidates in the clubhouse parking lot. Four candidates passed element 2 to join the Amateur Service, one candidate passed element 2 and 3 to become a General. Three candidates upgraded to General class.

Thanks to the following for their service and time. Leonard - KA7NWF; Jan- K7HTU; Rich- KK7VH; Stephen- AD7AB; Phillip- K7PIA The next scheduled test session is Tuesday, February 9TH 2021. Phil-K7PIA reported there will be two sessions next Tuesday February 9th with 23 signed up.

Info Tech and Website (Randy WB4SPB)

Randy reported "All systems nominal." Website is updated with all info received to date. Also as a reminder: when done with computers, just log off and leave or log off and put the computer to "sleep", do not turn off the computers because then Randy cannot update or work on them remotely.

HF Operations (Phil K7PIA)

Phil checked the HF stations January after the VE session January 12th. Mike-W7XTZ set-up in the RCT parking lot for Winter Field Day with his portable radio a 706 MK2G and a SOTA beam. About 30 contacts were made using low power (not QRP). Phil-K7PiA and Rich –KR7W assisted Mike. See Contest Calendar.com for upcoming events.

Repeater Ops (AL N7OMS submitted this written report)

RPT team is looking into the receiver level loss. We bypassed the helical resonators section and were able to increase receiver sensitivity somewhat. Team will be looking at trouble shooting the resonator section and retuning on Thursday.

Facilities Management (Adam W2NCC)

Adam made a project list for 2021 and will be looking for team members to help.

- repair handicap ramp
- tower maintenance and grounding
- work on exterior of the building
  - windows, some need recalking and painted

- siding
- shed and garage

- Install new security camera system

Property Management (Red WB7EC)

We had good income last month with $440 sold off the current sales list.

Museum (Rich KR7W)

No report

Weds Workshop (Randy WB4SPB)

TBD for February. Randy doesn't know if he wants to do another "show and tell" as participation is low for those topics now.

General Meeting (Verna KF7SCB)

Program will be on space weather resources

Unfinished Business

Mike-W7XTZ wanted to know if issues of city's 14th Street encroachment are ongoing? Apparently Doug Schafer's letter to the city has put this issue to rest for now.

New Business

Verna-KF7SCB wanted to ask for advice on FD to possibly have it at Frontier Park in Graham which is a more accessible location for those of limited mobility. However ARES uses the park during Field Day so there would be issues of interference. Current thinking is that the Western State location can be adapted to use for those of limited mobility by having those with need to park nearer the tents on the flat.

Activity Reports and Discussion Topics

None offered.

Announcements

- Doug Oakman – AD7AV has a new book published and available on Amazon.
- Bruce-WE7P worked new country on FT8, he contacted Z35T in North Macedonia (formerly Yugoslavia)
- Gary-WG7X wanted to have a first anniversary Donut Eaters Net at the clubhouse with operator in club house and a pushup tent outside with coffee and donuts. March 21 is the 1-year anniversary but Gary's suggestion is to have the celebration about Saturday, April 3rd hoping for better weather.

Adjournment at: 20:06 Local.

Respectfully Submitted,

Mike Drorbaugh

RCT Secretary

Attachments: Attendance list

Treasurer's report

Treasurer's Report to BOD 20210203 by S Dightman AF7YD **(include in BOD Minutes)**

UPDATING of ACCOUNT CONTACT INFORMATION

Mike W7MKE and I are trying to get the important account contact information updated. An email forwarder has been established so that RCT can receive mail at secretary@w7dk.org and then forward to the secretary. This forwarder also forwards to treasurer@w7dk.org which is a real email account. That way there will be two sets of eyes for important communications. This way, the board will have only one forwarding address change to make instead of about eight, each time a new secretary comes on board. Our 3 insurance policies and have been updated so

ISP Provider Rainier Connect Updated Account: In 2020 Tacoma Click moved all internet service accounts from Advanced Stream as part of Click's reorganization. Randy WB4SPB graciously established a new account with Rainier Connect. That account has been updated to secretary@w7dk.org with me as the primary person and Mike Drobaugh has account access.

Equipment Insurance

The ad-hoc Equipment Insurance Review team (Adam Barbara W2NCC, Mike Drobaugh W7MKE, Bruce Hanson AE7P, Steve AF7YD) list revised the equipment listed in the policy as follows:

Prior, 2020 & before, Policy Equipment Valuation was $XXX.00, for a Policy Cost $353.00

And after deletions of obsolete equipment and newly identified equipment by the Review Team for the Current 2021 Policy:

Equipment listed in 2021 endorsement $XXXX, Policy Cost $479.75, for an increase cost of $126.74. Policy cost is 1 ½% of Equipment Replacement Value listed in the endorsement schedule.

Not all known equipment was selected to be included in the equipment policy. Contact Steve AF7YD if interested in specifics.

Recent Bills of Note: Safe Deposit box for 2021 has been paid. $55.00 PO Box for 2021 has been paid. $326.00 Equipment Insurance $479.75 Liability Insurance $448.44 Property Insurance $1114.87 Insurance Total $2,043.00

Dec-Jan Utilities $623.61

End of Report

Radio Club of Tacoma General Meeting Minutes

February 13, 2021 ZOOM MEETING

Officers and Directors Present:

President Mike Mikuchonis W7XTZ

Vice President Adam Barbera W2NCC

Secretary Mike Drorbaugh W7MKE

Treasurer Steve Dightman AF7YD

Board Verna Lilly KF7SCB

Board Phil Pia K7PIA

Board Paul Matney K7PFU

Board Red Cranefield WB7EC

Board Bruce Hansen WE7P

Meeting Called to Order at: 13:32 local by President Mike W7XTZ

Quorum? (A 10% quorum of voting membership required to "do business") A quorum of the membership was not present. 24 members and visitors were in attendance for all or part of the Zoom Meeting.

Welcome and Acknowledgement of New Members and Visitors

Richard Crow KJ7SVM of Graham, WA has his General License. He's not sure what his interests are in Ham Radio just yet and was attending to get some ideas.

Ellen Hardin KJ7RSM/AE of Steilacoom, WA recently upgraded her ticket to Amateur Extra after testing at a recent RCT VE session. This is not her first visit to an RCT Zoom meeting but she is new to the area and has begun to attend our meetings.

Health and Welfare/Silent Key & Illness

Nick K7MO recently found out he has some heart issues and has to have some surgery for that this coming week. Once that is healed, he will still have to have his foot amputated. We extend our best wishes to Nick for him to have speedy recoveries. He seems to be in very good spirits during our Saturday morning Zoom gatherings.

George K7GRS as you may recall, had a heart attack back in December and now 60 days later his doctor reports George is 100%. Thank you for that excellent news!

A former RCT Member Paul Forsstrom KF7MSQ became a SK on February 1st.

Secretary's Report

Normal and usual stuff: membership renewals are tapering off so mostly getting in bills, magazines, and occasional QSL cards.

Treasurer's Report

We've updated our Inland Insurance inventory list which covers radio equipment. Significantly we updated the list to include the tower and some, but not all, of the Museum radios. We have three kinds of insurance, liability, property and inland insurance which all totaled come to about $2K per year. December/January utilities were about $600. Steve is learning some more about QuickBooks specifically about budgeting so that may come into play in the next month or two as departments project and learn how to work with budgets.

Committee / Activity Reports

Membership (KJ7GGB)

George –K7GRS reported membership at 247.

Library (AD7AV)

George _K7GRS indicated not much happening so all is normal.

Steve-AF7YD indicated that a book about how antennas work was recently ordered from a Great Brittan source and it should be here soon. It will be placed in the check-out library.

Training (AD7AB)

No report

VE Report (AC7WW)

VE REPORT by John AC7WW

It was cold, but dry on Tuesday February 9th in the clubhouse parking lot. Your VE team was host to 23 candidates in two sessions. Thirty-three exams were graded, with 17 new Technicians joining the Amateur Service. Two candidates upgraded to General and two upgraded to Extra. Two failed to obtain their original license.

Thanks to the following for their service and time.

Leonard, KA7NWF Jan, K7HTU

Rich, KK7VH Stephen, AD7AB

Phillip, K7PIA Mike, AD7TH

The next scheduled test session is Tuesday, March 9th, 2021.

HF Operations (K7PIA)

After January VE testing Phil K7PIA checked all the stations and they were all working correctly.

As far as contests, you can visit www.contestcalendar.com to find them. Right now the CQ WW RTTY contest is ongoing. The ARRL International DX CW contest kicks off the 20th.

Recently Randy-WB4SPB updated software for the Flex Radio with newer SDR program and new version of WSJT-X.

Winter Field Day was January 30th and Mike-W7XTZ set up in the RCT parking lot and operated a 1-O station (outdoors, low power). Along with Phil K7PIA and Rich Patrick KR7W they made about 30 QSOs using Mike's Icom 706 MKIIG and his SOTA beam 80M dipole.

Repeater Operations (N7OMS)

No report. There was some discussion about recent repairs to the Helical resonator on the 147.280 repeater which improved performance significantly. AL-N7OMS has started discussions about getting a new repeater as the old equipment we have is only serviceable by a few knowledgeable people. New gear is more plug and play with replaceable components. This makes the gear more serviceable but may hasten the demise of Amateur Radio knowledge on how stuff works.

Steve-AF7YD reminded people to use the 440 repeater more.

IT Report (WB4SPB)

No report

Museum (KR7W)

No report

Property Management (WB7EC)

January sales were $440. This month the club sold the 20 boxes of tubes that had accumulated in storage. A team of RCT members spent several days sorting and inventorying the tubes. We received $500 from a tube dealer for them. Our sales list of items hasn't changed since last month and Red WB7EC indicated he needs to get to club to find out where everything is right now with all the new donations and space changes. Mike-W7XTZ reminded everyone that Property Management is a very important component of our annual income.

Facilities Management (W2NCC)

Club house needs some exterior repairs and upgrades, notably the ramp to the kitchen door. Adam hopes to have some projects ready when weather improves this summer.

4th Wed. Night Activity (WB4SPB

No report.

Bark Editor (WG7X)

No report.

Unfinished Business / Announcements

No unfinished business.

New Business

No new business.

Program Verna Lily (KF7SCB)

The Program was on Space Weather Resources and the informational handout is attached with links to many of the resources.

Show and Tell

Mike W7XTZ mentioned that he was going to get a ZS6BKW antenna. It is a variant to the G5RV antenna. Ellen Hardin stated she once used one and it resonates well on 20M and 40M less well on 10 and 17 but works 6M – 80M with a tuner. It is somewhat shorter than an full 80M dipole at about 103'.

Tuning and Traffic

Bruce WE7P mentioned he was able to make a contact with Z35T N. Macedonia on 17M and 20M using FT8 and his vertical antenna.

Announcements

Steve-AF7YD mentioned that the HamCation online event was ongoing today and tomorrow (www.hamcation.com) with several interesting topics including one he liked on 3D printing. Many of the topics may be available on YouTube later.

Verna-KF7SCB indicated that Field Day will be FD at home again this year. We can get points for working 1D and 1E stations but now 1D and 1E are limited to 150W PEP.

John N7TES announced that there is now a posting a schedule for MARS testing on 60M.

Adjournment: at 14:29 Local

Mike Drorbaugh – W7MKE

Secretary

FEBUARY RCT SURPLUS

VIRUS DONATION 2021

Contact RED WB7EC at E-MAIL(bruce-ec@hotmail.com) to reserve/make offer on

Any item

DONATION

18. Yaesu HF PWR AMP FT-2100B (80 meters in op) $300.00

25. Kenwood XTAL Filter YG-455C-1 $50.00

41. Suitcase with Tektronix scope camera $50.00

84. Comet Triplexer CFX-514 $40.00

19. Elecraft HF XCVR K1 TWO bands 15/40 /AT $ 300.00

125. Kenwood TR-9000 2MTR XCVR $ 100.00

127. Mirage 2 meter mobile amp B-1016G $ 150.00

138. Kenwood HF RX R-599D SN: 530265 UNDER REPAIR

147. DX Engineering Remote Coax Control Switch CC-8 $ 400.00

148. DX Engineering Coax Switch RR8-HP P/O #147

149. Kenwood HF XCVR TS-930S SN: 2120327 $ 600.00

150. Kenwood Speaker SP 930 P/O #149

151. Kenwood MIC MC-60 P/O #149

152. Kenwood Power Supply PS-30 $ 50.00

156. MFJ Active Antenna MFJ-1020C $60.00

157. MFJ Dual Speech Enhancer MFJ-618 $150.00

166. Mirage VHF 6 MTR AMP a-1015G $ 200.00

167. Vectronics Antenna Tuner mod HFT 1500 $ 300.00

174. CDE Rotor Control H-IV/CD-45-II $ 50.00

180. Rig Blaster plug & play Digital mode interface $. 30.00

181. Emerson speaker $. 5.00

182. Archer rotor control PN: 15-1220 $. 5.00

183. Wilson WR50U rotor control $ 7.00

184. ICOM IC-H19s2 VHF hand held/ BM-70 charger $ 7.00

185. two Amateur TV stations in portable boxes $ 500.00 for both/300.00 each

186A. Sony DCR-HC 42 camera case $ 50.00

186B. Sony DCR-HC 42 camera case $ 50.00 186A/B $ 75.00

189. Motorola MFR M12 L box $ 5.00

190. Motorola MSRS 12 Regulator box $ 5.00

191. F2A85-V motherboard $ 3.00

193. Heathkit Sine Wave Audio Generator IG-5218 $ 30.00

194. Zenith old Radio not complete $ 20.00

195. Zenith old radio complete $ 30.00

198. Philco old radio $ 10.00

200. Home made test set $ 10.00

201. Patrolman Pro 2 receiver $ 5.00

202. Aldenmarine Fax IV $ 30.00

205. COMP USA 250 watt ATX power supply $ 10.00

206. COMP USA 250 watt ATX power supply $ 10.00

212. Lafayette Speaker model 99-2571 $ 30.00

215. Blue box with 4 headsets $ 20.00

223. Kenwood 2/220 mobile XCVR TM-621A,no mic/pwr cable $ 50.00

226. B & W Antenna Tuner VS300A $ 90.00

227. Elecraft HF XCVR KX3 # 10797,NEW in BOX/extra parts $ 900.00

229. MFJ Artificial GND MFJ-931 $ 90.00

230 MFJ Noise Cancelling Signal Enhancer MFJ-1026 $ 150.00

231. MFJ Dual Channel Speech Enhancer MFJ-618 $ 180.00

232. Murch Transmatch/Antenna Tuner UT-2000A 3.5-30MHZ $ 100.00

234. MFJ RF Preselector II MFJ-1040 $ 40.00

235. MFJ Active Antenna MFJ-1020A $ 40.00

236. Heathkit Antenna Noise Bridge HD-1422A $ 20.00

237. Heathkit Speaker SB-600 $ 100.00

238. MFJ Morse Key Board Keyer MFJ-452/HP Keyboard $ 100.00

239. Drake HF Receiver R-4C (early model) SN: 16553 $350.00 for SET 240 & 241

240. Drake HF Transmitter T-4X SN: 13105B $ P/O 239

241. Drake Speaker/PS MS-4 $ P/O 239

242. ICOM VHF XCVR IC-211/no mic $ 200.00

243. Alinco VHF Handheld XCVR DJ-196T $ 45.00

244. Vertex VHF Handheld XCVR VX-150 $ 45.00

245. Heathkit HF Receiver SB-301 $ 150.00

246. Heathkit Speaker SB-600 $ 100.00

249. Kenwood Power Supply KPS-12 $ 50.00

251. Vista Inverter 12VDC to 115VAC $ 15.00

252. Icom HF XCVR IC-720A $ 350.00

253. Icom Power Supply IC-PS15 $ P/O 252

254. Icom Microphone IC-SM5 $ P/O 252

255. NYE Viking Keyer SSK-1-K $ 35.00

256. Icom HF XCVR IC-735 $ 450.00

257. Icom Power Supply PS-55 $ P/O 256

258. Icom HF Tuner AT-150 $ P/O 256

259. Icom Microphone IC-SM6 $ P/O 256

Random Thoughts about the Club's Scratchy Sounding Repeater….

By Jimmy Olsen, Loggers Bark Cub Reporter

When participating in the Tuesday Night Net… I'm sure you've heard the Net Control say something like, "Somebody doubled with you. Come back again with your call." **Q:** What happened just before that?

A: Two (or more) stations were transmitting towards the repeater receiver at the same time. The receiver let both signals through which resulted in a garbled signal being re-transmitted to all other listeners. The following conditions contribute to the garbled receive signal being re-transmitted to all listeners:

One. Both received signals are about the same signal strength.

Two: Both signals contain different audio and levels

Three: Both signals arrive NOT at the same time.

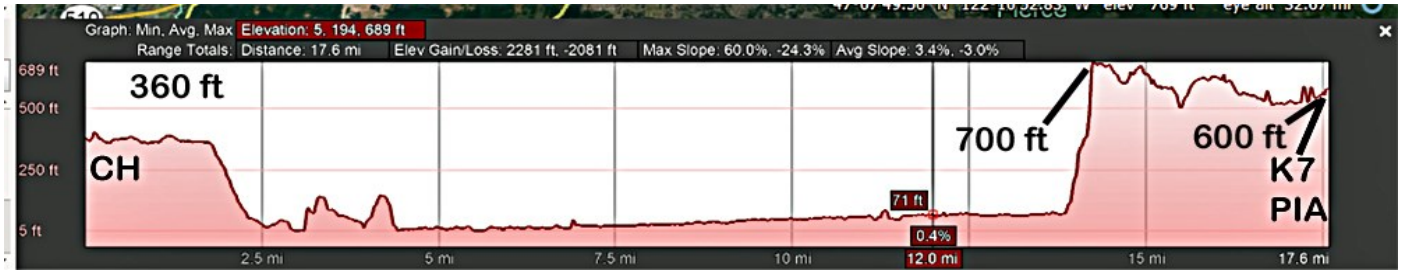
Above I mentioned Two OR MORE stations were transmitting. If Station #3 was quite a bit weaker than the two stations that were received…. Then Station #3's signal is discarded by the receiver (the nature of an FM receiver). If only Station #3 was transmitting then chances are high that he/she would have been received by the repeater receiver and heard by Net Control. How much level difference in signal strength is needed before the receiver can receive both signals at the same time? Less than 8 dB signal difference which is a bit less than 10 times the signal strength. For HF operators, that's **1.25 S-Units** if I squint at the meter just right. Say that the signal strength difference is 12 dB, then the weaker signal will be discarded by the receiver.

Sometimes W7DK repeater users complain about the repeater sounding scratchy or popping noises obliterating signals. "We should have the repeater people check the SWR or Power Output" is sometimes contributed on the air to solving this problem. This problem usually goes away after a few hours or the next day. My experience tells me that the problem is NOT an equipment or antenna issue, but is most likely **M**ulti-**P**ath **I**nterference– where a repeater users signal is being reflected off an object before it is received by the repeater… AND at the same time – the repeater is receiving the users signal via the intended direct path. So, in essence– the repeater is receiving two separate signals. It could be said that this one repeater user is doubling with her/himself.

An old timey example of MPI is your Off the Air TV's picture having **"Ghosts".** One of the images received by the TV is bouncing off of some object. Before Digital Off The Air TV– Those big McCord AFB planes flying over our house distorted my TV's picture.

One time while operating in the Fall VHF contest in Mt. Rainier National Park– we found the loudest signals from the north and easterly directions by aiming our Yagis towards the mountain. Aim at Mt. R and chat with a ham near Bend, OR… or in BC, Canada. Mt. Rainier is a pretty big reflector, as it is a big shield of radio waves.

Some hams are more susceptible to MPI more than others due to their location. Club member Phil K7PIA's signal is likely to be very distorted when atmospheric conditions make MPI likely. Using Google Earth Pro on my PC, I added a Placemark (yellow pushpin) of Phil's address (just ask Google or Facebook where he lives) and a Placemark of the Clubhouse address. Then using the Ruler Tool to plot a Path (gotta be Path, not Line) between the two Placemarks– Google Earth gives me a Topographical graph of the route.



Google Earth will also allow me to move the elevation plot cursor along the path and a duplicate curser follows the map. Doing this I see that Phil's obstruction of a direct path to the ClubHouse is is an escarpment on the west side of Bonnie Lake (not the town). It's a mole hill at 700 ft. I'd guess that Phil's signal on a non MPI day is considerably attenuated because of the mole hill geography. When the atmosphere turns on the MPI machine– chances are high that Phil's signal is going to bounce off a big reflector nearby and a 'ghost' signal will be delivered to the repeater's receiver. By the way– Google Earth elevation plotting is fun– give it a try.

What can be done to prevent MPI? Here's a random thought: Perhaps the New Administration in WA DC will order the FCC to contract with the Army Corps of Engineers to build a 15K ft conductive screen shield around Mt Rainier. Possible but unlikely. In a mole hill in the way situation- like Phil's– it's likely that installing a high gain Yagi in the direction of the ClubHouse will overcome the loss of signal caused by the mole hill like obstruction. Then Phil's signal strength could be high enough to overcome the MPI ghost signal being received by the repeater. I suspect Phil is doing this now. If not, it's worth a try. **Caution: Be sure to orient your Yagi Polarization Vertically.**

End of Random Thoughts. Here's a Linear Thought: A Request of sorts: Chat it Up On The Air about replacing the old GE MASTR II 147.280 repeater with modern equipment. This will not fix MPI, but it will increase reliability of the repeater that club members love to use.

by KR7W dit dah dit dah dit

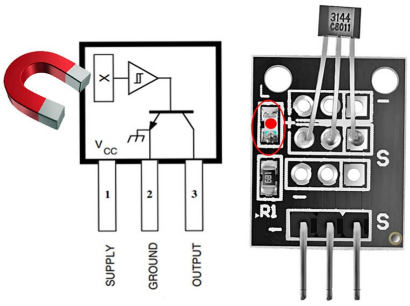
Show n Tell February 2021 by KR7W

A small amount of progress has been made with the January 2021's Show n Tell project—**the K3NG Radio Artisan Arduino microcontroller Antenna Rotator Controller**, built entirely from Chicom/CCP sourced electronic modules and parts from Amazon, Ebay or Banggood.

Prologue: The **RC**s Arduino microcontroller was set up for a (very popular) Yaesu controller. Yaesu's method of reporting the direction the antenna is pointing (or **AZ**imuth) uses a 500 ohm **pot**entiometer that rotates in concert with the rotators mast. The pot provides the microprocessor a DC voltage from 0 to 5 volts and is calibrated to the voltage that corresponds to the AZ in degrees. Example: S or 180 deg equals 2.5 volts. N or zero degrees equals 0.01 volts. This was an easy method to test the Arduino controllers functions. For Example: Rotate the pot on the proto board– then see the AZ degrees change on the display. Mostly Easy-Peasy.

After that success it was time to emulate the Alpha Spid rotator method of AZ tracking. The Spid rotator uses a Direct Current motor to make it turn. Ex: **Neg**ative—**Pos**itive 12 VDC applied- turns the shaft **C**lock**W**ise. Pos-Neg turns the shaft **C**ounter **C**lock**W**ise. The Spid rotator outputs contact closure pulses at the rate of one pulse per degree of AZ change. The Arduino controllers job is to count the pulses from the calibration point- to keep track of the AZ the antenna is pointing to. [Note: the Arduino Controller is calibrated by manually by turning the rotator to 180 deg, then sending a keyboard command to calibrate the controller).

The goal of this part of the project is to push the CW or the CCW front panel buttons to operate the CW and CCW motor relays to make a DC motor turn CW or CCW, and have the motor initiate pulses so the Arduino can count them to display the Azimuth. All this without connecting the controller to the Spid rotator.

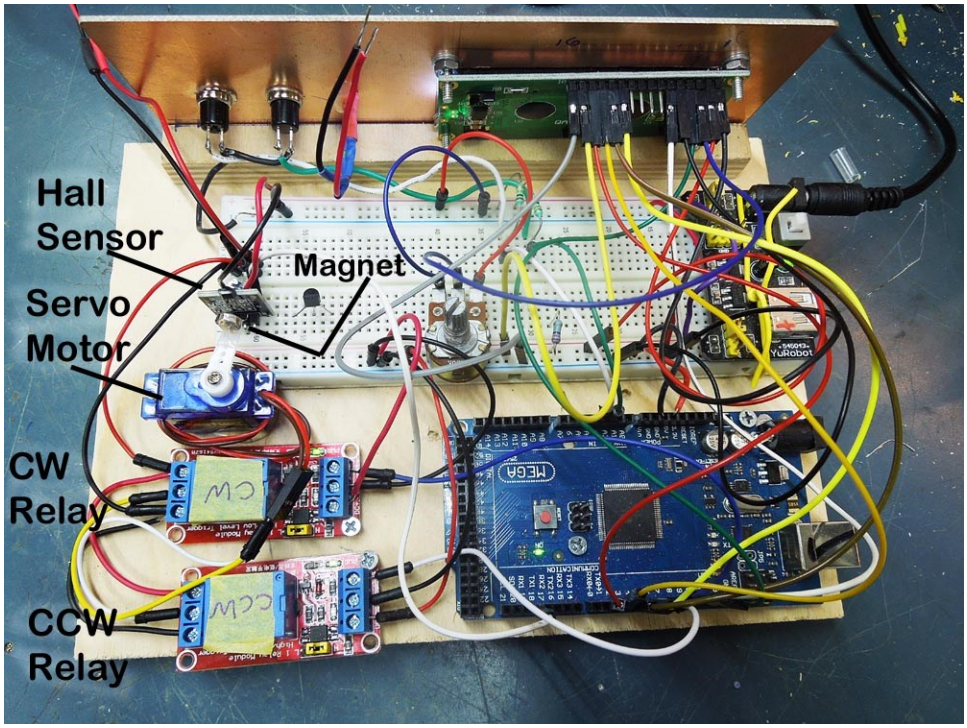


Amazon provided CCP / Chicom parts used:

Left photo is a Hall Sensor Module. It senses magnetism at the top of the 3 leg transistor looking component. It outputs a pulse as the magnet passes by. The schematic shows when magnetism is present a GND signal is outputted to the Circuit Board which is sent to the Arduino. Also, a CCP shade of Red LED illuminates.

Center Photo is a Hobby Servo Motor– used for DIY robots or radio control airplanes or boats. A nylon arm is attached to the shaft of the blue motor body to move the position of another device. Inside the blue body is a Pot that reports back to the controller its position (sorta like the Yaesu Controller mentioned above). The servo motor was taken apart to remove the pot and a mechanical stop to allow the motor to spin around and around in circles. Reverse the Plus-Minus polarity and the motor spins the opposite direction.

Right Photo is a gaggle of Hobby Magnets– a small one was chosen for this project.

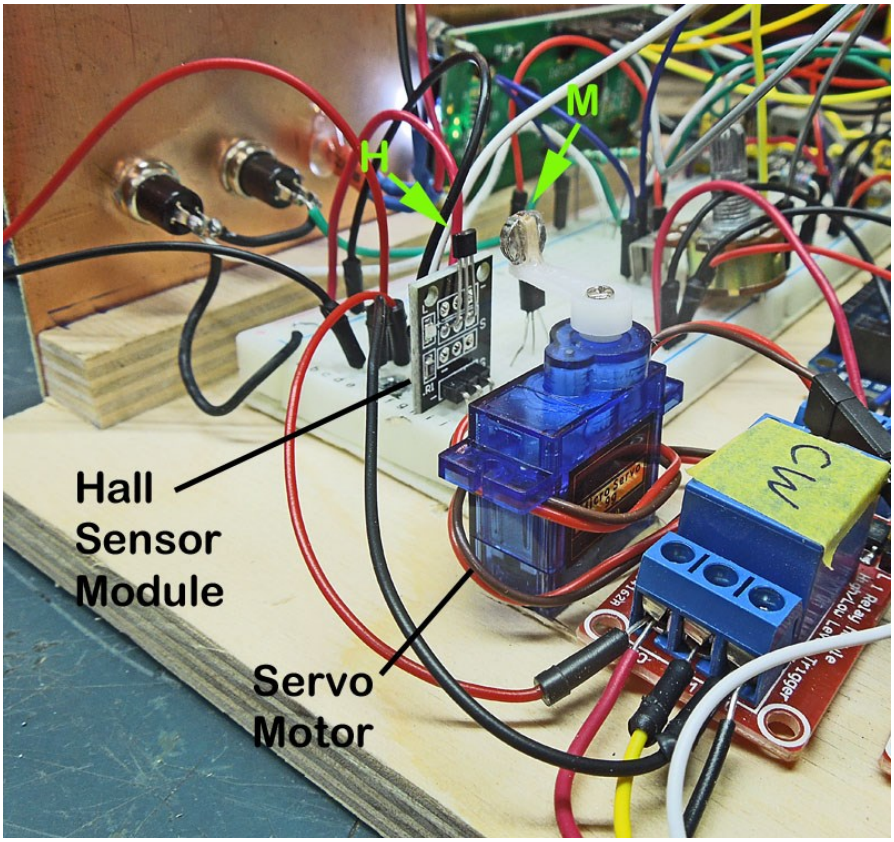


L Photo shows the addition of the Hall Sensor magnetism detector plugged into the proto board and the modified Servo Motor hot glued to the plywood board.

A half length nylon actuator arm is attached to the motors shaft… and a small hobby magnet is glued to the end of the arm.

When the CW Push Button Switch is operated– the motor rotates in the CW direction and the magnet at the end of the arm passes by the Hall Sensor– which outputs a pulse. When the CCW Push Button is operated– the motor spins in the opposite direction as before. The Arduino Controller is programmed to register a 1 degree change for each pulse received. Based on if CW or CCW Push Buttons are pressed– the Arduino Controller adds or subtracts degrees of AZ on the front panel LCD display (see last months **Show n Tell** article).

R Photo shows close up of Spid rotator Pulse simulator. Green H is the Hall Sensor. Green M is the little magnet glued to the end of the motors spinning arm.



Next Steps: Make it run on Standard Ham Radio 12 VDC– which involves adding a 12 to 5 VDC buck regulator to run the Arduino and LCD display. Then replace the small 5V relays with high current capacity 12V Automotive Relays to switch NEG-POS / POS-NEG 12V to the Spid rotator motor. Mosfet relay driver transistors must be added to handle the high current to operate the automotive relays. Also add a buffer transistor to isolate the Spid pulse output to the Arduinos input pin.

Epilogue: After adding the Hall magnetic Sensor and the modified Servo Motor, then witnessing it work… it was very satisfying and can attest that this is the coolest project yet-so-far built in the KR7W Basement Bunker Workshop. I've found 2 more sheets of paper… so keep reading >>>

More Show n Tell… Feb 2021 by KR7W

New Project Report: FCC Part 97.1 and Adventures with Infra-Red Detectors

Remember **O**le **J**oe? If OJ and I hadn't parted ways after the November election… and ***IF*** he was present, he wudda crankily said something like: **"This article is foolish and has nothing to do with ham radio… why would you want it published in the Bark Newsletter?"** Normally, I'd tell OJ to go take a nap. But instead I would have said this: **"It IS ham radio related based how I interpret FCC's Part 97 that defines the Amateur Radio Service"** Selected underlined parts shown below emphasize what I mean.

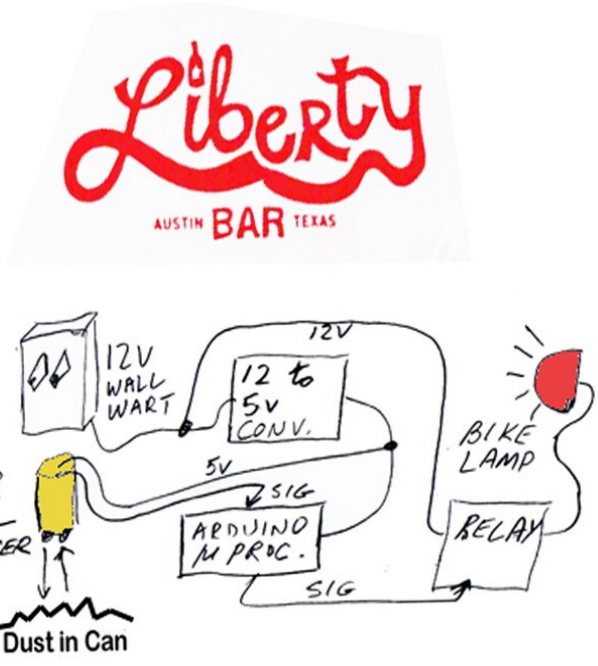
§97.1 Basis and purpose.
The rules and regulations in this part are designed to provide an amateur radio service having a fundamental purpose as expressed in the following principles:
(b) Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art.

(c) Encouragement and improvement of the amateur service through rules which provide for advancing skills in both the communication and technical phases of the art.

Now, The Basement Bunker Project Build: A 'Time to Empty' Indicator for Dust Collector Sawdust Bin

History: A short while ago I purchased a new table saw for my woodworking shop. Unlike before, the sawdust must be sucked out of the saw by a powerful vacuum or dust collector system. So a new dust collection system for the saw and other dust generating tools in my shop was built. 99.5 percent of the dust is captured- by a blower with a cyclone- and falls into a 20 gallon trash can– aka the Dust Bin. If the bin over fills… then that dust is blown into an very expensive 1/2 micron secondary filter– which could easily be ruined by too much dust. To protect my new investments… it's important to know when it's time to empty the dust bin.

Confession #1: This project is a copy cat / reverse engineered version of Oneida Air's Infrared Dust Sentry Bin Level Indicator . I've never seen this product, nor the instruction documents, but I know it uses IR (Infra Red) sensor to detect the dust level and has an easy to notice Blinky Light Bin Full alarm indicator.



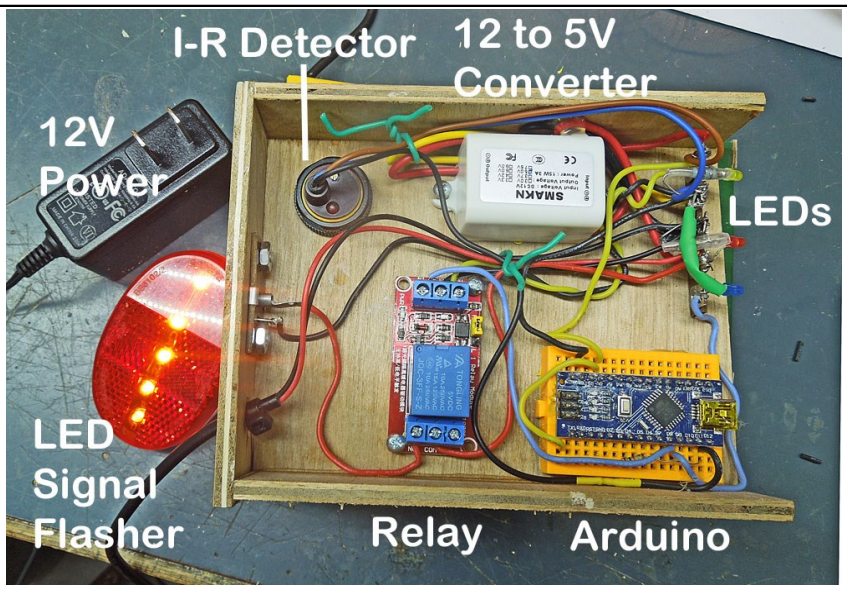
L photo shows Cocktail Napkin Engineering drawing of my version. The 12V Wall Transformer provides 12V for the Blinky Light. It also feeds the 12V to 5V buck converter to create the needed 5V for the Arduino and IR Proximity Switch.

R photo: ***CCP*** built, via Amazon, E18-D80NK Proximity Sensor Switch Module. It contains a Infrared Transmitter-Receiver, a voltage regulator, microprocessor, and distance adjustment pot– all for about $8.

Fun Facts Sheet:

http://ett.co.th/productSensor/E18-D80NK/Manual_IR-Sensor%20Switch%20E18.pdf

As seen in **R** photo– the project is built in a box made from CCP plywood. The IR Proximity sensor protrudes through a hole in the bottom of the box. The LED Signal Flasher is a repurposed bicycle tail light with super bright LEDs. When a signal comes from the IR detector– it triggers the Arduino which outputs a 1 second flashing signal to the Relay to repetitively turn the Bike Lamp LED Flasher On-Off.



All of the components– in living color– from the Cocktail Napkin engineering drawing. Too bad the bars are closed. I'm out of napkins to sketch out other ideas for skill building projects.

Confession #2: I intended for this project to generate an audible Tone, but I gave up attempting to program the Arduino to do so. (Maybe a Bark reader can assist?)

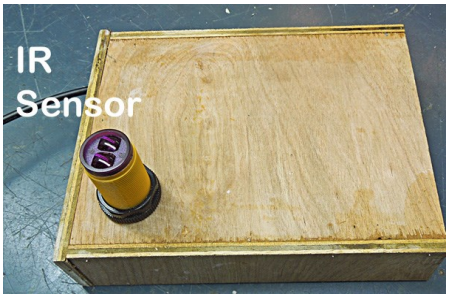
Why use 12V instead of 5V? Incase the LED Signal Flasher isn't noticeable enough– then a home security alarm horn (13V) or a more noticeable enunciator can be used instead. Since the Tone feature doesn't work– the Arduino really doesn't need to be used– but it was a fun experiment to include it.

I can hear Old Joe saying, **"C'mon Man! How does this silly non-ham radio project fit into FCC Part 97.1?"**

"C'mon Old Fool, wake up and take a looky at 97.1.c, second part: Advancing skills in technical phases of the art." This simple Infrared Dust Bin Alarm project demonstrates the logical flow of signals, like: The IR sensor signals the Blinky Bike Light through the Arduino and Relay. Pretty much same as: Push your IC-7300's Mic PTT Button– and the Antenna Relay operates to connect the transmitter part of the transceiver to the antenna.

In your old IC-725 or old timey Yaesu FT-101E or even in RCT's Ancient 147.280 GE MASTR II repeater- there are buck voltage regulators or converters- 13V to 10V, 5V or 3.3V. If you sort of know what they are supposed to do- perhaps you can test if yours is working when the need arises.

So, OJ– I strongly believe that **if** the Ham Radio Operator advances their skills in the technical phases of the art– then they can easily advance in the communication phases of the art (97.1.c first part). With increased development of the communications and techy skills… then the amateur radio operator can better contribute to the advancement of the radio art (97.1.b). Once this happens, then hopefully it'll be Paid Forward. **L** Photo: Infrared proximity detector protruding out the bottom of the plywood control box (into the dust bin).



R Photo: Control box sits atop the dust bin lid monitoring the sawdust level.

Thanks for reading thus far.

72 (QRP), 73, 74, 75 (1.5 KW), from the basement bunker— now time for a nap. Dit dah dit dah dit, KR7W

MAIL BAG!

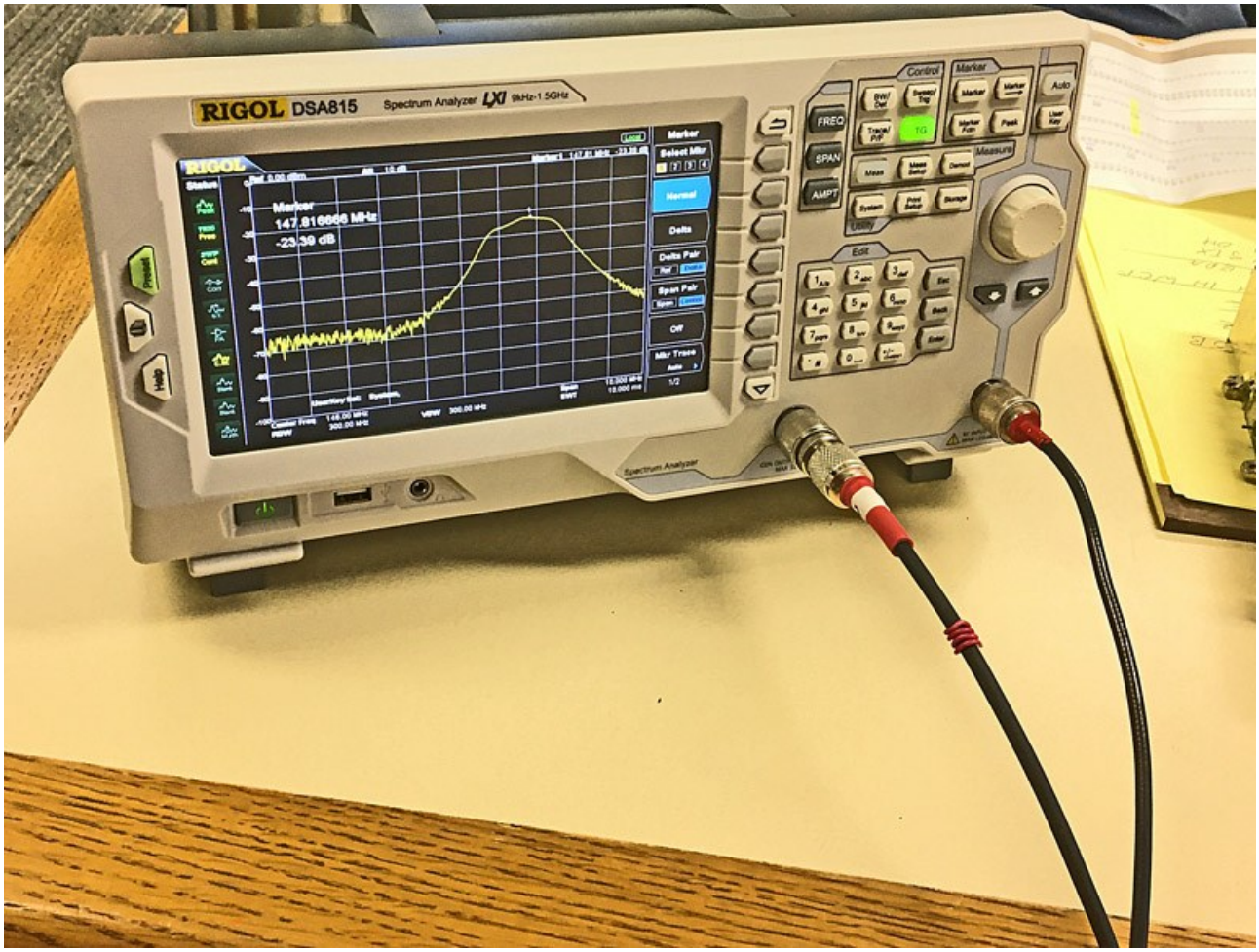
A COUPLE OF INTERESTING PICTURES FROM RICH KR7W. THESE SHOULE BE OF INTEREST TO ANYONE WHO HAS BEEN ON THE 147.280 REPEATER RECENTLY.

W7DK Repeater Tech, Al N7OMS, is adjusting the tuning capacitors of the Helical Resonator band pass filter in the ancient GE Mastr II radio receiver. After loosening the tuning capacitors lock nuts- that were corroded and making poor electrical connection- and adding No-A-Lox conducting grease under the nut- N7OMS is adjusting for the highest level throughput as seen in the Spectrum Analyzer photo.

Photos by KR7W who also says: The defective Helical Resonators has nothing to do with the noisy buzzy sounding audio that sometimes plagues the repeaters Off the Air receive signal. Trust me, I've got the SCIENCE.

History: A couple of months ago… the repeater's receiver became insensitive / deaf. It couldn't receive weaker signals, like from Dave W7UUU's QTH. Repeater Techs determined that the receiver's Helical Resonators, aka front end band pass filters were defective. They introduced too much loss, so were bypassed. These photos show the process of fixing this problem.

The defective Helical Resonators (band pass filters) in the 147.280 repeater's receiver is displayed on the **S**pectrum **A**nalyzer screen (SA). The SA very quickly sends a changing frequency signal from 145 MHz to 148 MHz over and over, around and round in circles- into the Helical Resonator cavity. The SA is also receiving the signal at the various frequencies around and round in circles at the output of the Helical Resonator. The SA draws the received signal levels on the screen. Here, the object is to peak the output to be at the repeaters receive frequency of 147.280 MHz. Radio Club Repeater Technician, Al N7OMS is adjusting tuning capacitors and watching for the best response on the screen.



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www.w7dk.org [LINK] - For the latest and most current information on events and activities, visit the Radio Club of Tacoma Website.

Radio Club Repeaters

Central Tacoma: 147.280 + PL=103.5

Crawford Mountain 147.380 + PL=103.5 (E of Olympia © 1500 ft ASL)

Central Tacoma: 440.625 + PL=103.5

North Tacoma: 145.21 – PL=141.3